building annelid, evidently formed out of the gritty matter which occurs, though sparingly, in the clay. The tubes with their contents were handed over to Dr. v. Willemoes-Suhm, who found the worms to belong to the family Ammocharidæ (Claparéde and Malmgren), closely allied to the Maldania or Clymenidæ, all of which build tubes of sand or mud. The largest specimens dredged are 120 mm. in length by 2 mm. in width. The head is rounded, with a lateral mouth. There is no trace of cephalic branchiæ. The segments are not divided from one another; but the *tori uncinigeri*, which are occupied by the hair-like setæ, and the elevations bearing small *uncini*, indicate the beginning of a new segment.

There is no doubt that this annelid is closely allied to the genus *Owenia*, but it differs from it in the absence of cephalic branchiæ. Malmgren, has, however, already proposed the name of *Myriochele* for a form in which this absence of branchiæ occurs. The description of the northern form on which Malmgren's genus is founded is not at hand, so that it is impossible in the meantime to determine whether the two forms are identical or specifically distinct.

As bearing upon some of the most important of the broad questions which it is our great object to solve, I do not see that any capture which we could have made could have been more important and more conclusive than that of this annelid. The depth was 2,975, practically 3,000, fathoms—a depth which does not appear to be greatly exceeded in any part of the ocean. The nature of the bottom, which consists of a smooth red clay with a few scattered sand grains and a very small number of foraminifera shells, was very unfavourable to higher animal life, and yet this creature, which is closely related to the Clymenidæ, a well-known shallow-water group of high organisation, is abundant and fully developed. It is fortunate in possessing such attributes as to make it impossible even to suppose that it may have been taken during the passage of the dredge to the surface, or have entered the dredge-bag in any other illegitimate way; and its physiognomy and habits are the same as those of allied forms from moderate depths. It affords, in fact, conclusive proof that the conditions of the bottom of the sea to all depths are not only such as to admit of the existence of animal life, but are such as to allow of the unlimited extension of the distribution of animals high in the zoological series, and closely in relation with the characteristic faunæ of shallower zones.

On Thursday the 13th our position at noon was lat. 18° 54′ N., long. 61° 28′ W.

On the forenoon of the 14th we were still 35 miles from land, and we sounded in 1,420 fathoms. The bottom had altered greatly in character: it now consisted chiefly of calcareous foraminifera of many species, mixed with a considerable portion of the broken spicules of siliceous sponges. The bottom temperature registered was 3° C. The water-bottle was accidentally broken in taking in, so that that observation was lost. As we were now within sight of land, and all our results were evidently modified by its immediate proximity, we regarded our first deep-sea section as completed. WYVILLE THOMSON

A MODERN STERNBERGIA

AT a time when botanists of some repute are not ashamed to confess their inability to deduce satisfactory characters for the determination of plants from their internal anatomy, old workers in this field may well turn back to refresh their memories on such points, and to inquire whether their eyes may not have deceived them in the investigations of former years when microscopes were not what they now are. In doing this a few days ago in connection with the examination of a carboniferous conifer, I was surprised to find that I had overlooked or omitted to note the fact that the Balsam Fir of Canada (*Abies balsamea*), which affords the well-known Canada-balsam, has that curious structure of pith well known in Palæozoic Conifers, and which has been named *Sternbergia*. It is well seen in young twigs one or two years old, and though on a smaller scale, is very similar to that of *Dadoxylon materiarium* of the upper coal-formation of Nova Scotia and Prince Edward Island, as I have figured this in my recent report on the geology of the latter province.

This modern Sternbergia is not produced by the mere breaking of the cellular tissue transversely by elongation of the fibre; but, as I pointed out many years ago in the case of the coal-formation Sternbergiæ,* is a true organic partitioning of the pith by diaphragms of denser cells opposite the nodes, as in *Cecropia pellata*, and some species of *Ficus*, &c. The pith of the Balsam Fir is, like that of many other conifers, composed of dotted or transversely marked cells elongated vertically, and reminding one of the pseudo-vascular pith of some Lepidodendroid trees. The transverse diaphragms are composed of denser cells flattened horizontally, and they are, as in Sternbergia, accompanied by constrictions of the medullary cylinder. As in some fossil conifers, the diaphragms are not perfectly continuous.

The plan of growth of the modern fir does not permit its pith to increase in diameter. This was different in the Palæozoic conifers, in which the Sternbergia pith is sometimes nearly two inches in diameter.

In Palæozoic, as in modern times, Sternbergia piths were not confined to one family of trees. Corda has shown this structure in *Lomatophloios*, which is equivalent to *Lepidophloios* or *Ulodendron*. I have shown that it exists in several species of Lepidodendroid and Sigillaroid trees and in *Leptophleum*.† Williamson, who first established it in the Conifers, has also found it in *Dictyoxylon*. Still I have nowhere found these remarkable fossils so abundant as in the upper coal-formation, and either in the interior of calcified or silicified trunks of pine or with fragments of wood attached to them sufficient to indicate their coniferous character.

I may add, that the microscopic structure of young twigs of modern conifers presents many interesting points for comparison with fossil trees, and that in making longitudinal slices of the pith of recent specimens, care should be taken not to be misled by the mere crumpling of the cellular tissue sometimes caused by the pressure of the knife. J. W. DAWSON

NOTES

PROFESSOR CARUS, the well-known naturalist of Leipsic University, who is to fill Professor Wyville Thomson's chair during the absence of the latter with the *Challenger*, commenced his duties on May 2 last, by an able and eloquent address on the study of zoology. He is fully convinced that "the final form of our (zoological) system will be a pedigree."

THE *Challenger* arrived at Halifax on May 9, all well. She had a successful passage from Bermuda, the dredgings and soundings being very satisfactory. On the 18th inst. she will leave this port on a return voyage to Bermuda.

WITH great regret we record the death of Mr. John Stuart Mill, at the age of 67 years, on May 8, at Avignon, from a sudden attack of erysipelas, which cut him off in four days. He has been buried beside his wife at Avignon. A meeting of the friends of Mr. Mill has been convened, at Willis's Rooms, for Tuesday, 20th inst., to consider in what manner the national respect for his memory may be most fittingly testified.

A COMMITTEE for the erection of a monument to Liebig has been constituted at Munich. Councillor von Niethammer is the chairman, Prof. Von Bischoff the vice-chairman, and Professors

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* Canadian Naturalist and Geologist, 1857.

† Journal of the Geological Society, May 1871.

Vollhard and Von Jolly are the secretaries. The King of Bavaria has subscribed 1,000 florins.

THE purchase for the National collection, by the Trustees of the British Museum, of Mr. A. R. Wallace's splendid collection of birds from the Malay Archipelago, will be gratifying to all who are interested in science. Mr. Wallace being so thoroughly acquainted with ornithology, and having obtained so many of the specimens himself from localities recorded by himself at the time, makes the collection much more valuable than the skins alone would have been, if they had been accumulated by a less thorough master of the subject. That such is the case, is proved by the great value of Mr. Wallace's paper on the Parrots of the Malay Archipelago, which appeared in the Proceedings of the Zoological Society, nearly ten years ago; and another on the Pigeons of the same region, published in the *Ibis*, at about the same time. It is also not to be forgotten, that the discovery of one of the most important of recent points in physical geography, namely, the situation of the line which separates Asia from Australasia, in other words, *Wallace's line*, was made in great measure from the observations by the author,—whose name is thus deservedly immortalised,—of the differences in the avifaunas of Bali and Lombock.

THOSE of our readers who are interested in University science teaching will be glad to learn that Dr. Michael Foster's course of Elementary Biology at Cambridge, which commenced last week, is attended by more than 30 students. This unexpectedly large attendance has taxed to the utmost the space at disposal. However, such arrangements have been made as will enable every student to have a fair though not large amount of space at his disposal, each set of reagents, &c., being used in common by two or three men. Nothing could illustrate more strongly the urgent need for further provision of working-room for biological students at Cambridge; as scarcely any space is now available for advanced histological, embryological, or physiological research. Dr. Foster's course this term is very similar to that given to science teachers in the summer at South Kensington, and is the first that has been held in term-time at Cambridge, a few students having gone through a like course last long vacation. It is probable that there may be a still larger attendance at future courses of this kind, as Dr. Foster announced that he should require students to have received this or similar teaching before admission to the winter courses of practical physiology. Dr. Foster is assisted in the work of practical demonstration by Mr. H. N. Martin, D.Sc., M.B. of Christ's College, Mr. C. Yule, B.A. of St. John's College, and Mr. T. W. Bridge, of Trinity College, the newly-appointed Demonstrator of Comparative Anatomy.

MR. JOHN ARROWSMITH, the well-known geographer, died on May 2, at the age of eighty-three years.

A GENTLEMAN writes us that he was invited by the Royal Commissioners to act as a juror at the Vienna Exhibition, but was at the same time coolly told that our Philistian Government had placed no funds at the disposal of the Commissioners wherewith to defray the necessary expenses of those who are willing to devote their valuable time and experience to the service of their country. Our readers will not be surprised at this. Other Governments have discovered that even in the most commercial, as well as in the highest light, the encouragement of science "pays." The British Government, with five millions on the right side of their account, still regard science as a beggarly Lazarus, to whom, for mere shame's sake, they are compelled to throw an occasional crumb. As our correspondent says, poor little Switzerland has devoted two and a half times the pittance our Government have allowed to defray the expenses of the Vienna Commission; while the amount expended by Austria in their department of former exhibitions was at least four times as much as we have devoted to theirs.

CAPT. F. J. OWEN EVANS, R.N., F.R.S. Chief Naval Assistant in the Hydrographic Department of the Admiralty, and in charge of the Magnetic Department, has been appointed Companion of the Most Honourable Order of the Bath.

THE publication of the eighth volume of the *Zoological Record* which, as we announced some time since, has been so long delayed through the unfortunate indisposition of one of the contributors may now be shortly expected. The ninth volume containing the zoological literature of 1872 is now in hand, the recorders being the same as in the eighth volume, with the exception of Prof. Traquair, whose place is supplied by Prof. Lütken of Copenhagen. The Editor will be glad to receive separate copies of papers published in journals (especially those which have not a very wide circulation) addressed to the care of the publisher, Mr. Van Voorst, 1, Paternoster Row, London. Such separate copies, however, to be of use, should have the original pagination indicated.

THE Society of Antiquaries of Scotland has just come into the enjoyment of an estate in Caithness, of which the reversionary interest was bequeathed to it for the purpose of founding a Lectureship of Archæology.

MR. BESSEMER intends to found a gold medal, to be given annually to any member of the Iron and Steel Institute who may have displayed literary capacity, or promoted the progress of metallurgical science by original research.

PROFESSOR NEWCOMB'S "New Tables of the Motions of Uranus," are announced as already in the press, and may be expected to be published during the approaching summer. They have been prepared and will be printed at the expense of the Smithsonian Institution. Prof. Newcomb has already, by using all known observations of Neptune, compiled the very accurate tables for computing the motions of that planet that have been used in the "American Nautical Almanac." Having thus provided for the most distant member of our system, he has now returned to Uranus, and finds that his present tables (which will complete the survey of the solar system) represent quite completely the hitherto inexplicable movements of that body.

THE Cincinnati Observatory, founded by Prof. Mitchell, is, we learn, to be removed, and established in a manner worthy of the wealth of Cincinnati. From the drawings it may be judged that the dome of the new building will be thirty-five feet in diameter in the inside. The new site was highly approved of by Prof. Abbe, who continued until lately to be the director of the observatory at Cincinnati, and was presented by John Kilgour, Esq., who also added thereto the sum of ten thousand dollars to provide for the new building.

AMONG the resolutions adopted by Congress at its last session was one authorising the President to invite the International Statistical Congress to hold its next, or ninth, session in the United States. The invitation is to be formal and cordial, and it is provided that should this be accepted the President is authorised to appoint the usual organisation commission, and to take the other preliminary and necessary steps for the meeting of this body, and for holding its session at such time as may be deemed expedient by the Statistical Congress.

A TELEGRAM announces that some of the crew of the Arctic exploring ship *Polaris*, which left New York under the command of Captain Hall in 1871, have been landed in Newfoundland. They were picked up in an open boat 40 miles from the coast of Labrador. It seems, by their statements, that in August 1872, the ship, being beset with ice, commenced landing provisions.

Suddenly the ice broke, and the men who were upon it were carried away. They drifted southward for 196 days—more than six months—and the ice, which originally was five miles in circumference, was gradually reduced to a few feet. They then took to the only remaining boat. Captain Hall, they report, died of apoplexy in November 1871. These statements have been received with distrust.

MR. LAMONT's beautiful steam yacht *Diana*, which has been chartered by Mr. Benjamin Smith, of London, for a voyage of exploration in the Northern Seas, left Dundee on Saturday. The yacht is manned by a crew of twenty, and although there is a sailing master, Mr. Smith will have complete control. The first point of rendezvous will be Cobbe's Bay, on the north-west of Spitzbergen, where Mr. Smith expects to meet his own sailing yacht, the *Samson*, which was despatched from Hull with stores on May 1 under the command of Captain Walker, for many years connected with the Dundee whaling fleet. Every effort will subsequently be made to push as far northward as possible. During the voyage marine and land plants will be gathered and observations of the tides and currents made. The *Diana* is provisioned for a year, but the object contemplated is expected to be realised in about six months.

AT the recent meeting of the Delegates of the French Learned Societies, gold medals were awarded to the following:—M. Leymerie, for his geological studies in the Pyrenees; M. Bleicher, military surgeon, for his interesting geological observations on the central plateau of France and the environs of Montpelier; M. Guillier, for his researches on the geology and industrial products of the department of Sarthe; M. Pomel, for his investigations on the geology of the Sahara; M. Sirodot, for his work on the algæ (*Lemanea*), which grow in fresh running water. Silver medals were awarded to M. Cauvet for various observations on vegetable anatomy and physiology; to M. Verlot, for his catalogue of the vascular plants of Dauphiny; M. Gassies, for his investigations on the terrestrial and river shells of New Caledonia; to M. Villot, for his observations on the curious metamorphoses and strange migrations of certain worms found in wells and in standing water.

IN 1859, an attempt was made to start a Zoological Garden in Philadelphia, which fell to the ground during the subsequent war. A fresh company is now being formed to carry out the original intention, though on a larger scale. A site has been secured in Fairmount Park, and capital is to be obtained in the following manner:—Certificates of stock are to be issued of not less than fifty dollars each. All receipts derived from the Gardens and collections of the Society, are to be applied annually—first, to the maintenance of the establishment; secondly, to the payment of six per cent. on the stock; and third, any balance remaining to go to the gradual extention of the collection of the Society and the improvement of its grounds. Many influential citizens are supporting the project.

THE Annual Report of the Visitors of the Royal Institution shows a considerable increase in the number of members, and is otherwise very satisfactory.

THE Rev. Thomas Fowler, M.A., Fellow, Sub-Rector, and Tutor of Lincoln College, has been elected to the Professorship of Logic at Oxford, vacant by the death of Prof. Wall.

MR. HYDE CLARKE will on Tuesday, the 20th instant, read a paper at the Anthropological Institute, on "The Egyptian Colony and Language in the Caucasus."

THE Royal Cornwall Polytechnic Society, has published its list of prizes for 1873. The largest sums, varying from ten guineas to one guinea, are offered for improvements in mine ventilation, mining, boring machinery, and similar departments. Small premiums are offered for essays, local observations, and collections of Natural History, especially such as illustrate the Natural History of the county.

WE have received the "Report on the Condition of the Sea Fisheries of the South Coast of New England in 1871-2," by Prof. S. F. Baird. As the result of a thorough investigation, Prof. Baird comes to the conclusion that during the last few years there has been a decided decrease in the number of food-fishes in these waters: the decrease being mainly due to the combined action of the fish-ponds or weirs and the blue-fish, the former destroying a large percentage of the spawning fish before they have deposited their eggs, and the latter devouring immense numbers of young fish after they have passed the ordinary perils of immaturity.

FROM the "Report of the Commissioners of Fisheries of the State of New York," we learn that the rivers of that State are being plentifully stocked with useful fish, especially shad; and the Commissioners are confident that the people of the United States will in a short time rely upon restocking their waters, and not upon game laws, to keep up a full supply of fish for their markets.

WE have received the first two parts of Mr. Tegetmeier's magnificent work on "Pheasants for the Covert and the Aviary." We shall notice it fully when completed.

THE much-vexed question as to whether seals are fish or not, as regards the oil to be obtained from them, has recently come up in a practical shape between the governments of the United States and Newfoundland. The fishery treaty lately entered into between the United States and Great Britain, and about to go into actual operation in the course of the present summer, provides that *fish* oil shall be admitted free, but that other oils shall pay a duty of ten per cent. This question is one that would be very easy of solution if it were purely zoological in its character, since, as every one does or should know, the seal and porpoise, as well as the whale, are warm-blooded mammalia, having nothing in common with the fish any more than has the man who, for the time being, goes into the water for the purpose of bathing. It appears, however, to be the general practice with commercial nations to class all oils obtained from marine objects, whether cetaceans, birds, or fishes, as fish oil, and on this ground it is probable that the claim of the Newfoundland authorities to have seals recognised as fish will be accepted.

THE following additions to the Brighton Aquarium have been made during the past week:—Two young Seals (*Phoca vitulina*) from Jan-Mayen Island, Arctic Sea, presented by Mr. John Clark; two Porpoises (*Phocæna communis*), from Rye Bay, purchased; one Angler (*Lophius piscatorius*), from Cornwall; Bass (*Labrax lupus*); Gurnards (*Trigla lineata*); Grey Mullet (*Mugil capito*); Conger-eels (*Conger vulgaris*); Sand Smelts (*Atherina Presbyter*); Pollack Whiting (*Gadus pollachius*); Rocklings (*Motella mustela*); Sand Launce (*Ammodytes lancea*); one Octopus (*Octopus vulgaris*), from the French coast; two cuttle-fish (*Sepia officinalis*); Prawns (*Palæmon serratus*); Foliaceous Coralline (*Eschara foliacea*); Anemones, numerous.

THE additions to the Zoological Society's Gardens during the past week include a Chinese Water Deer (*Hydropotes inermis*), from China, presented by Mr. R. Swinhoe; four Peafowl (*Pavo cristatus*), from India, presented by Mrs. Stern; two Koodoos (*Strepsiceros kudu*), and a Pluto Monkey (*Cercopithecus pluto*), from Africa; a Weeper Capuchin (*Cebus capucinus*), from South America, deposited; three Cole Tits (*Parus ater*), from the British Isles; four Spix's Cavies (*Cavia spixii*), from Brazil; a tawny Eagle (*Aquila nævioïdes*), from Africa, purchased; a Markhoor (*Capra megaceros*); five Peacock Pheasants (*Polyplectron chinguis*); and five Chilian Pintails (*Dafila spinicauda*), born in the Gardens.